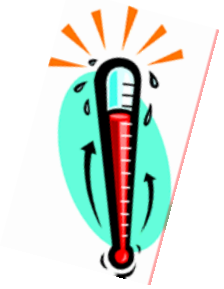
Montana Natural Heritage Program Update

Partners Committee Meeting, October 2007



Funding: Major Progress and Next Challenges

We've made major progress toward our FY08-09 core funding goal of $668,000 per year. The 2007 Legislature approved an increase of $150,000 (50%) for the Natural Heritage Program core contract. This is a huge accomplishment, and couldn't have been achieved without the strong support of State Librarian Darlene Staffeldt and Digital Library Director Jim Hill, as well as the initial endorsement of this ambitious proposal by our Partners Committee. Thank You!!

The State contract represents about two-thirds our core funding goal; for the remaining $215,000, we rely on partners who use NHP information services. Our most significant gain over the past few months in this area was a new partnership agreement with the Natural Resource Conservation Service. The focus will be to train NRCS biologists in using the web Tracker to get biological data for project reviews. We also received a funding boost from the BLM, which added $10,000 to their annual core services funding, to cover inflationary cost increases over the past few years. These are important gains, and we want to thank NRCS, BLM and all our other good partners for their support of NHP services. However, more work is needed, as we remain about $70,000-per-year short of our goal for this critical source of core funding.

New State Contract for FY08-09

The State Library renewed its contract with the University of Montana for operation of the NHP over the FY08-09 biennium. In addition to the substantial funding increase from the Legislature, the major feature of this contract was a new Scope of Work for the next two years. It was gratifying to take stock of everything we've accomplished in the last biennium; these gains enabled us to set many new objectives for data development and service, consistent with our Strategic Plan for 2006–2010. Copies of the new Scope of Work will be available at the meeting for interested partners.

Land Stewardship Data & Web Tracker Continue to Draw Praise

Our Land Stewardship Database (mapping of public and conservation lands) continues to attract much attention. Earlier this year, the Legislative Auditor's Office relied heavily on the Stewardship Database to complete a review of conservation easements in the state. The report found that "land stewardship data maintained by the MNHP is probably one of the most complete and accurate records of conservation easement locations in the country" and hailed it as "a considerable benefit to the state of Montana."

The Natural Heritage Tracker, our newest web tool for serving access to extensive species distribution data and other spatial coverages, continues to be incredibly successful. Since the expanded version went live in late July, users have logged nearly 1000 hours, and we've received nearly 1000 new observation records. It's among the most advanced data delivery tools in the entire Natural Heritage Network!

UM Spatial Analysis Lab joins the NHP

MTNHP recently assumed management of the UM Spatial Analysis Lab. We were approached in early summer by retiring Lab Director Roly Redmond, who was looking for a strong UM program that could provide a secure new home. The lab's longstanding role in vegetation mapping and habitat modeling made the NHP an ideal choice. Current projects emphasize ecological modeling for decision support and characterization of land cover (particularly sagebrush) using satellite imagery. The staff includes two GIS analysts with expertise in plant ecology and wildlife biology, an image analyst, an office manager, and several students. NHP Ecologist Linda Vance will serve as SAL Director. This increased capacity for spatial analysis will be a big asset in working toward better biological mapping and landscape analysis products for Montana, and will enable us to offer a broader range of services to assist our partners.

Ecology Program Highlights - *Greg Kudray & Linda Vance*

Wetland/Riparian Mapping Center

The National Wetland Inventory (NWI) was never completed for MT, and riparian mapping data is similarly lacking. We acted to fill that need by establishing the Mapping Center in 2006 to map wetlands and riparian areas to national USFWS standards.

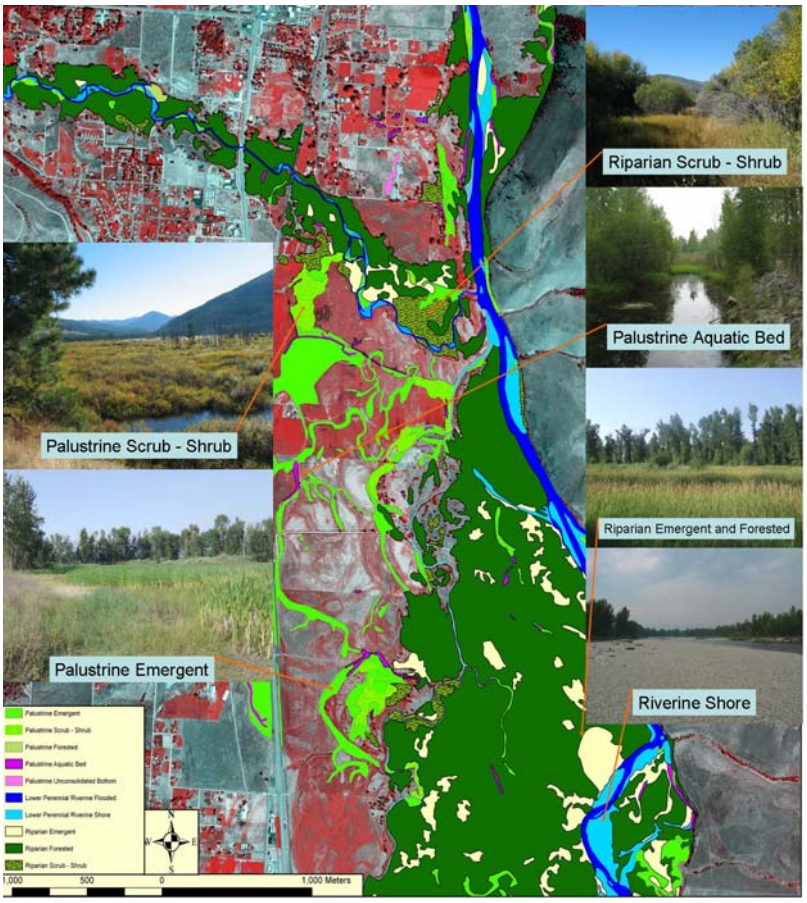
- 25% of MT is now funded for wetland mapping, thanks to several federal, state, county, and private partners.
- Two new wetland digitizing technicians will be hired within the next month.
- Bitterroot Valley mapping data has been quality approved by the NWI and incorporated into the National Wetland Geodatabase for public use.
- Field verification of wetland maps also enables us to collect data on species of concern and ecological communities.
- We're building an information system keyed to NWI types. Our web-based field guide includes information on the vegetation, ecological dynamics, and management of wetland types.
- Wetlands types are also linked to levels of ten hydrologic, habitat and biogeochemical wetland functions (e.g. sediment retention, nutrient cycling, aquatic habitat, etc.).

Wetland Mapping Projects

- Bitterroot Watershed
- Flathead Watershed
- Gallatin Watershed
- Upper Clark Fork Watershed
- Southwest MT (Big Hole, Ruby, Madison, Beaverhead, and Red Rocks Watersheds)
- Isolated wetlands (random quads across MT)
- Custer National Forest
- Eastern Montana – a 5 year , BLM-funded effort to map watersheds that will be selected with input from BLM and other partners

Wetland and Riparian Mapping Example

Bitterroot Valley



Bitterroot Valley Wetland Change

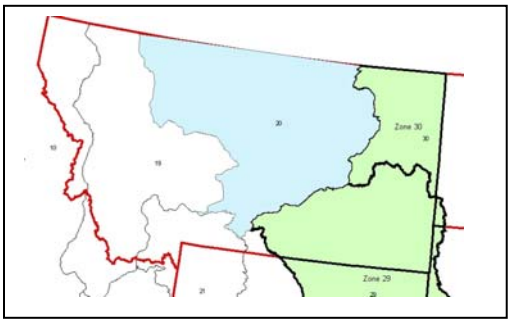
We're comparing new NWI wetland mapping to the early 1980's original NWI to determine how wetlands have fared in this rapidly developing valley. Hundreds of newly created recreational ponds and a dramatic decrease in beaver created wetlands indicate an important shift in aquatic wetland habitats and functions. Surprisingly, preliminary data shows relatively small natural wetland losses. A final report will be available early next year. (EPA, MT-DEQ funded)

One of many new ponds in the Bitterroot

USGS GAP Mapping Support

New GAP land cover mapping for all of MT will be available by early next year; some map zones are ready now. These will be the best available statewide maps of Montana's land cover. Our role includes:

- Assistance with the Ecological Systems used as mapping units (example: *Inter-Mountain Basins Big Sagebrush Shrubland*). Ecological System development includes creating a key to Systems, field sampling of representative Systems, and writing System descriptions.
- Develop a web-based field guide to Ecological Systems with information on System characteristics and management considerations
- Establishing a vegetation plot database for MT – a key need for future map development and a valuable resource for habitat management.



MT GAP map zones. Colored zones have been completed.

Sagebrush: Vegetation Succession and Bird Distribution

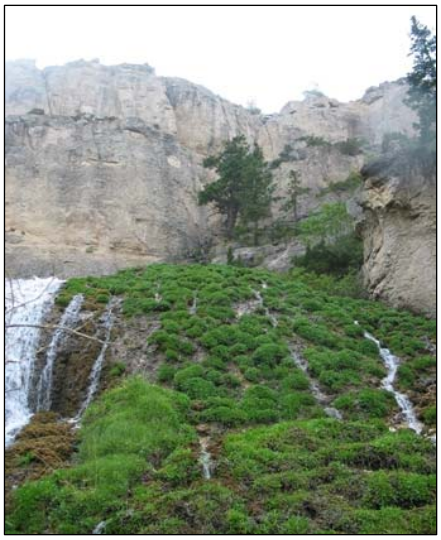
This BLM-funded project focuses on the response of sagebrush vegetation after prescribed or wild fires and includes an analysis of bird distribution and related habitat factors. Preliminary results indicate little regeneration of Wyoming big sagebrush after fire. Over 100 southeast MT breeding bird points were surveyed in 2006, significantly increasing our knowledge of bird distribution. The habitat analysis will link breeding bird presence and abundance to site vegetation and larger landscape factors like roads, land cover, water, and energy development infrastructure. This study will be complete at the end of year.

Geographically Isolated Wetlands

We've completed the first year of a study for DEQ/EPA documenting the extent and type of geographically isolated wetlands in Montana. Almost 80,000 currently mapped wetlands -- the majority of which are natural -- have no surface water connection to any stream or river, making it difficult to establish Clean Water Act jurisdiction.

Wetland Assessment Tools

We are also working on ecoregional approaches to developing a GIS-based wetland assessment tool, looking at factors (land cover, land use, population, road density etc) that predict wetland condition. During the past summer, rapid wetland assessments were conducted throughout Montana. This dovetailed with our assessment of wetland and riparian conditions in the Clark's Fork Yellowstone and Bighorn Lake subbasins, conducted for the BLM.



Sullivantia hapemanii in Layout Creek, Bighorn Lake subbasin

Other or Upcoming Ecology Projects

- **Watershed Assessment & Planning Tools** – We will work with the Ruby Valley Conservation District to develop a watershed-based planning database and tool that is independent of expensive GIS software and easy to use. We will also be working on a landscape assessment model for southwest Montana that incorporates new wetland/riparian mapping data and other spatial data into an interactive tool that can be delivered on DVD and serve the general public and expert GIS users.

- **Cattle Movements & Wetland Management** - We recently received a grant from the NRCS to use GIS in analyzing cattle movements relative to water sources and flavored supplements in northern Montana's Prairie Pothole region. The goal is to determine whether strategic placement of supplements can guide use patterns away from specific wetlands or wetland types whose ecological value (e.g. nesting or rearing habitat) is especially high.

- **Herbaceous Wetland Indicators & Reference Sites** - We received a grant from the EPA to identify key ecological attributes for herbaceous wetlands, develop indicators of ecological integrity, and establish a reference network in Montana. We will also be collaborating with Heritage Programs in Wyoming and Colorado to conduct a regional wetland assessment in the Rocky Mountains, in preparation for EPA's 2011 wetland REMAP effort. The REMAP is being planned by the National Wetland Assessment & Monitoring Workgroup, on which Linda serves.

- **Rapid Assessment Metrics** - MTNHP Ecologists are working with a NatureServe team to develop rapid assessment metrics; we have taken the lead for three major wetland types: peatlands, freshwater marshes, and freshwater aquatic systems. The draft report is being submitted to EPA at the end of October.

- **Ecological Systems Descriptions** – We will be developing ecological systems descriptions to provide detailed information for REGAP mapping units. These will form the basis for status ranking of ecological systems ranking.

Aquatic Highlights – *Dave Stagliano*

Montana Freshwater Mussel Surveys

This year, we began a statewide status assessment for the Western Pearlshell (*Margaritifera falcata*), which is considered a Tier 1 species by MFWP (2006 CWCS) and has for many years been listed as a Potential Species of Concern (S2S4) in Montana. This marks Year 1 of a 3-year freshwater mussel study, in partnership with MFWP and funded by a State Wildlife Grant.

Major Results from the 2007 field season include:

- Conducted workshops to train 33 fisheries biologists from state and federal agencies in techniques for finding and identifying mussels in Montana streams;
- Field surveys to determine status of previously documented locations, to document new populations, and to determine the extent of populations.
- Surveyed 266 stream points (8/multi-person, 130/2 person, 128/1 person searches).
- Systematically surveyed 18 River Basins (12 4th-code HUC's) with average reach length of about 300 meters, for a total of 79.8 km or about 50 miles evaluated.

- Found that 25 out of the 40 previously reported localities do not support viable populations.
- Recorded only 5 new viable populations.

Work in 2008, will focus on continuing to document western pearlshell populations, as well as systematic surveys for the other Montana mussels in eastern basins:

Ligumia recta (black sandshell)
Lampsilis siliquoidea (fatmucket)
Pyganodon grandis (giant floater)
Lasmigona complanata (white heelsplitter)-introduced recently
Quadrula quadrula (mapleleaf)-introduced recently

Zoology Program Highlights – *Bryce Maxell*

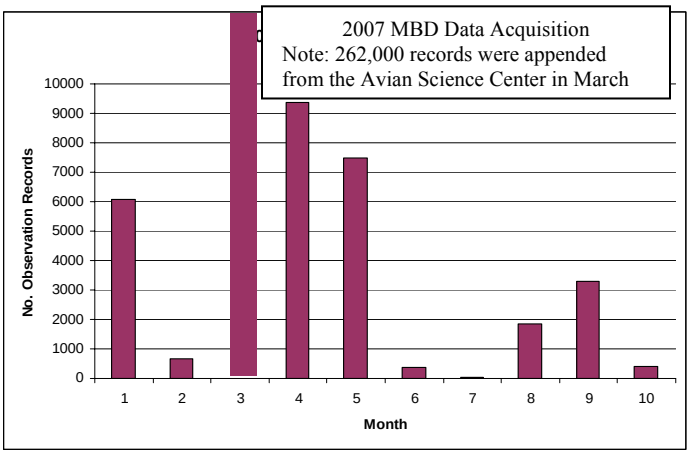
Core Databases

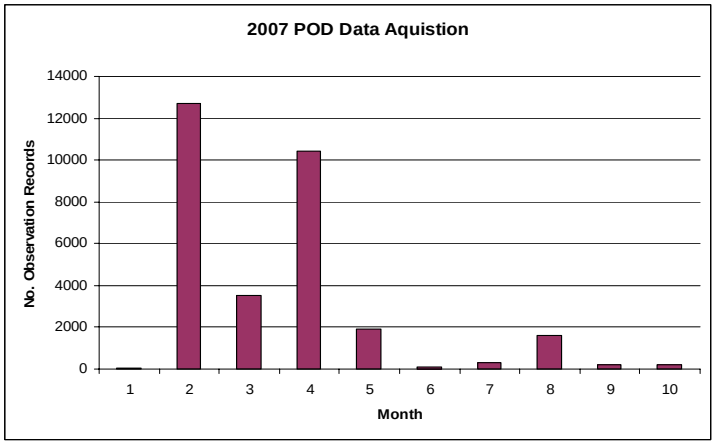
Data Acquisition

During 2007 we have added 291,668 bird observation records to the Montana Bird Distribution Database (MBD). Of these, 262,000 came from the Avian Science Center; 1,500 were entered on the TRACKER website; and 28,168 were appended from other databases or manually-entered.

During 2007 we have added 31,107 non-bird animal observation records to our Point Observation Database (POD). Approximately 125 of these records were entered on the TRACKER website and the remainder were appended from other databases or manually-entered.

Major data acquisitions included all animal observations from DEQ Coal Mine Reports, Bird Observations from the Avian Science Center, managed species information from FWP databases, USFS Fauna records from the Lolo National Forest, and all animal observation records from the Miles City Office of the BLM.





Data Management

During 2007, more than 35,000 animal observation records have been reviewed to ensure that: (1) the observation is credible and consistent with the known spatial and temporal distribution and habitat use of the species; (2) the record is accurately mapped; (3) a locational uncertainty is assigned; (4) the record represents an observation worthy of consideration for planning & environmental reviews (i.e., it is associated with reproduction for the species). Thorough review of these records has allowed us to develop element occurrences (areas documented as having been used to support breeding activity by Species of Concern which need consideration in project level planning). To-date we have mapped element occurrences for 110 of Montana's 123 vertebrate Species of Concern and 43 of Montana's 73 invertebrate Species of Concern. We plan to have completely updated element occurrence mapping for all animal Species of Concern by December of 2007.

An MOU with FWP has continued to slowly develop into a 7 page MOU and 40 pages of supporting documents that govern how the Heritage Program and FWP will interact for acquisition, management, and dissemination of animal data in Montana. This MOU should be signed before the end of 2007.

Data Delivery

Since mid-June the TRACKER website http://nhp.nris.state.mt.us/Tracker/NHTMap.aspx has received 915 hours (38+ days) of use by agency personnel and the general public to access information on animal distribution in the context of a variety of other data layers. Agencies with the greatest use include: USFS

= 58 hours; FWP = 22 hours; BLM = 10 hours. More detailed tracking statistics show that we need to increase outreach and training to a variety of state and federal offices so that they can make use of this website in resource management planning.

Our goal is to deliver five levels of map information for zoology data:

Map Product	Delivery Status
Generalized Distribution (quarter-quarter latitude and longitude grid cells)	Currently available on TRACKER website to view generalized distributions from 530,000+ observations
Point Observation Data	Currently available on TRACKER website for agency personnel to access 530,000+ point observations
Element Occurrence Data (Used in Environmental Reviews)	Currently available via mediated request. Plan to make available on TRACKER website by December 2007
Predicted Distribution Models	Hope to post GAP analysis models on TRACKER website in winter of 2007-2008. REGAP models are scheduled for completion winter of 2009-2010.
Range Maps	Plan to post on TRACKER website in December 2007.

Species of Concern List Update

A complete review of the status of all 196 Species of Concern and 90 Potential Species of Concern is scheduled to be conducted jointly with FWP early in 2008. The review will consist of interviews with species experts to document what is known about (1) population size, (2) area of occupancy, (3) short-term trend, (4) long-term trend, (5) severity, scope, and immediacy of threats, (6) intrinsic vulnerability, and (7) environmental specificity.

Northwest REGAP Predictive Distribution Models

Heritage programs in Montana, Wyoming, Idaho, Oregon, and Washington are combining forces to construct seamless predictive distribution models for vertebrates across the Pacific Northwest. The initial deductive and inductive models will be built in 2008 and then species experts will be asked to help review and improve the models during the winter of 2008-2009.

Recently Completed Field Projects (Partner Sponsored)

Terrestrial Mollusk Surveys for USFS

We recently produced a report summarizing the second year of surveys for land mollusks on R1 USFS lands in Montana http://mtnhp.org/reports/USFS_Mollusc_2006.pdf The report summarizes what is known about the distribution of species in Montana, identifies major areas of the state which still lack survey information, and estimates detection probabilities for species in order to identify the level of survey effort required to adequately monitor mollusk species. These surveys have identified a few species that are likely to be designated new distinct species with sister species in western Washington and will likely result in changes to global and state ranks for a number of species.

Bat Surveys for USFS

We recently produced a report summarizing the second year of surveys for bats on R1 USFS lands in Montana http://mtnhp.org/reports/USFS_Bats_2006.pdf The report summarizes what is known about the distribution of bat species in Montana, identifies major areas of the state which still lack survey information, outlines potential statewide sampling schemes that all agencies could use to cooperatively monitor bats, and estimates detection probabilities for bats to identify the level of survey effort required for effective monitoring of bat species. The report is critical of existing sizes of grid cells being used to monitor bats.

Grassland Bird Surveys for BLM

We recently produced a report summarizing grassland bird monitoring for the BLM in North Valley County between 2001 and 2006 http://mtnhp.org/reports/Valley_2007a.pdf The report summarizes trends in grassland bird species in one of the best remaining intact native grasslands on the northern Great Plains and provides management recommendations for maintaining habitats capable of supporting a variety of grassland birds. Grassland bird monitoring will continue in Valley County during the 2008 field season and MTNHP will propose a statewide grassland bird monitoring scheme in the near future.

Ongoing Field Projects (Partner Sponsored)

Terrestrial Mollusk Predictive Distribution Models for USFS

During the winter of 2007-2008 we will be using MAXENT software to analyze all of the point observations gathered for terrestrial mollusks during the 2005-2007 field seasons. The objective is to develop initial inductive predictive distribution models for terrestrial mollusks so that this information can be used for mitigating impacts to globally rare mollusk species in project level planning. These predictive distribution models will be used to identify field survey locations over the next couple of field seasons, which will feed back into improving the predictive distribution models. There is a great need to extend terrestrial mollusk survey efforts onto BLM lands in the future.

Amphibian and Reptile Surveys for BLM and FWP

We recently produced a draft Conservation Plan for the amphibians and reptiles of Montana which will be made available early in 2008. This report will remain a dynamic document that will be continually updated as future surveys are completed and as other research is made available in the scientific literature. During the 2007 field season amphibian and reptile surveys were conducted on lands administered by the Malta Field Office of the BLM. Over 1,100 wetlands were surveyed, and this information is available on the TRACKER website. During the 2008 field season intensive surveys are planned for southeast Montana in the area that is most likely to be developed for Coal-Bed-Methane.

Idaho Giant Salamander Surveys for USFS and FWP

During the 2005 field season Jennifer Copenhaver on the Lolo National Forest took photos of the first documented occurrence of Idaho Giant Salamanders in Montana south of I-90 near Saltese. During the 2006 and 2007 field seasons NHP teamed up with the USFS and FWP to survey hundreds of streams between Lookout Pass and Lolo Pass. During the 2006 field season, hundreds of Idaho Giant Salamanders were found in 15 different streams south of Saltese and Haugan. However, their distribution appears to be limited to that region because surveys south of there in 2007 failed to detect additional streams with salamander populations. See the following links for related stories/video:
http://fwp.mt.gov/news/article_5035.aspx
http://www.opi.mt.gov/Streamer/FWP/OutdoorRpt/Salamander_REF.mov

Diversity Monitoring with FWP

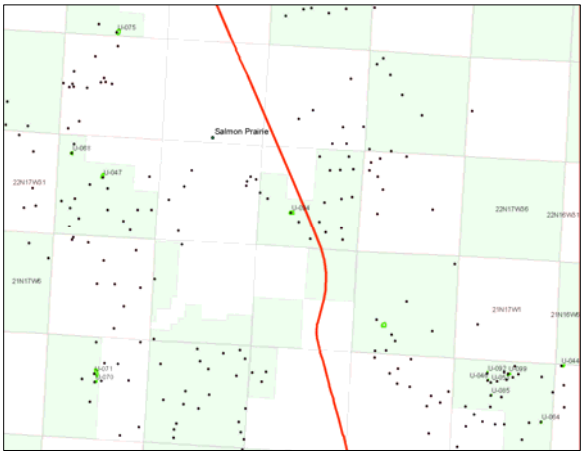
MTNHP is collaborating with FWP on a State Wildlife Grant to create monitoring schemes for small mammals, bats, amphibians, reptiles, and birds in order to continually assess the status and distribution of all vertebrate species in Montana. A pilot project will be conducted over the next couple years, with the ultimate goal of leveraging funding from a variety of partners in order to monitor the status of our wildlife in as inexpensive and collaborative a manner as possible.

Botany Program Highlights – *Scott Mincemoyer*

Water Howellia (federally threatened species) Monitoring

- Located 7 new water howellia ponds this season (4 on Plum Creek, 3 on USFS lands).
- New Water Howellia Monitoring Database.
  Tracking and Monitoring of potential water howellia locations, Includes:
  - -Over 400 locations (ponds/wetlands) searched by MTNHP staff prior to 2007.
  - -Over 80 Ponds searched by Flathead NF staff as part of the Flathead's monitoring Program
  - -Over 1,500 potentially suitable ponds/wetlands in the Seeley-Swan Valley in need of surveys. Locations selected using 2005 NAIP imagery and DRG's (1:24:000 topo maps).

This work is supported by the USFWS.



Potential water howellia locations in a portion of the Swan Valley

New Plant Observation Database

- Created new geodatabase (ArcGIS & MS Access based) for entry and tracking of plant observation data.
- Replaces Biotics Database as primary tool for managing plant observation data.
- Greatly increases efficiency in data entry, improves functionality in tracking observation data and tracking population trends.
- Eases mapping of locations in part by eliminating mapping of multi-part Element Occurrences.

Other 2007 Field Season Highlights

- Located an occurrence of flowering quillwort (*Lilaea scilloides*) in the Swan Valley, a species previously known in Montana only near Ninepipes Reservoir in the Mission Valley and not observed since 1965.
- Located new occurrence of dwarf woolly-heads (*Psilocarphus brevissimus*), an S1 plant only known from 5 other locations in the state.
- Discovered a new population of peculiar moonwort (*Botrychium paradoxum*), a globally rare plant -- first one for BLM land.

Peculiar moonwort

Species of Concern Report Update

- Updated SOC Report will be published in the spring.
- Will include more information on each species' rank as well as additional summaries.

Plant Status Ranks (S1-S5 ranks)

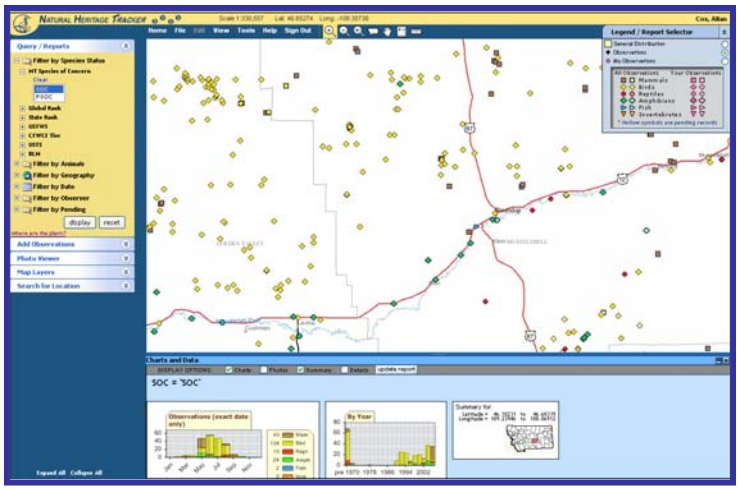
- Continuing effort to assign ranks to all native Montana vascular plants (Approx 2,400 plants).
- About half have been assigned a state rank, including all fern and fern allies -- an increase of approximately 500 in the last year. These will be available on the updated plant fieldguide.

Plant Fieldguide Revision

- Revamped web fieldguide for plants will be available in the next few months.
- Similar format to the revised animal fieldguide.
- More photos available for more species. Will allow for easy addition of new photos
- Status ranks and information will be available for all Montana plants. Will be an on-going effort to update and increase content.

Information Services Highlights – *Allan Cox*

Natural Heritage *TRACKER*



The newest version of the Natural Heritage TRACKER was released in July. We now have nearly 600 registered users with agency-level access that enables them to view the detailed observation data.

This newest release of TRACKER …

- provides distribution data birds *and* other animal species by quarter degrees of latitude and longitude and exact point locations for agency partners;
- provides the ability to select (filter) observations by animal group (mammals, birds, reptiles, amphibians, fish and invertebrates), by geography (county, latilong, quarter latilong, and quarter, quarter latilong), by status (global/state ranks, Species of Concern, agency designations, ESA), and by date;
- displays the results of the selection or filtering in a new report window that provides summary lists and charts as well as the observation details;
- provides statewide access to aerial photos, 1:24,000 topographic maps, land stewardship data, county and public land survey boundaries, and information on highways, lakes, and streams.
- enables users to enter observations for any animal species. As a result, we have already received nearly 1,000 new bird and animal observations!

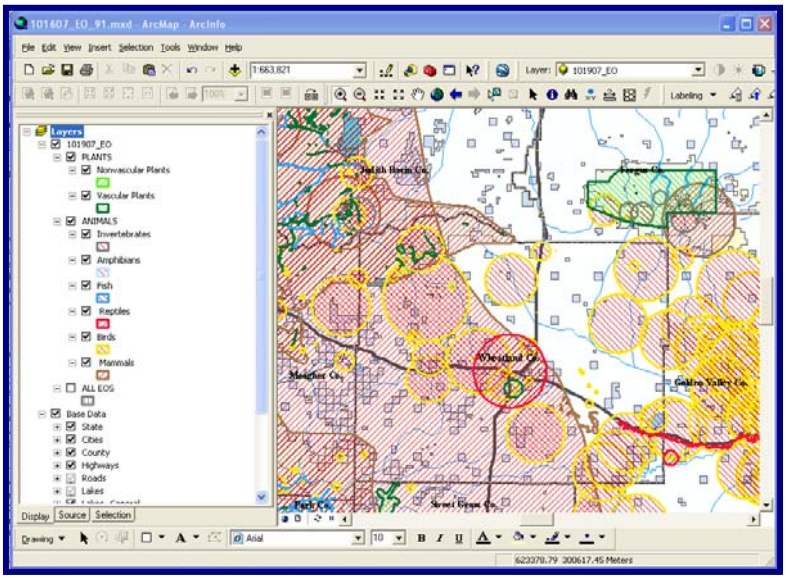
On a related note, MTNHP hired a full-time web applications developer (Dave Ratz) in August. Having the full-time support of an outstanding web development specialist is making a tremendous difference in our ability to deliver top-notch web services to our users.

Montana Field Guides

MTNHP has worked with the Department of Fish, Wildlife and Parks to develop a new and improved Montana Animal Field Guide. The revised Field Guide came on-line the week of October 22 with a new interagency web address: **http://fieldguide.mt.gov.** This Guide has a new look and feel, more photos (from both FWP and MTNHP image repositories), and faster operation.

The new Field Guide page also serves as the portal to our Plant Field Guide. A revised Plant Field Guide is now under development, with public release planned for early 2008. It will feature an updated look and feel similar to that of the Animal Field Guide, as well as more photos, illustrations, and information. We also plan to include predictive habitat maps where available.

Montana Department of Transportation Map Service



MTNHP recently entered into a service agreement with the Montana Department of Transportation to supply the MDT with a live, internet map service of element occurrence data for animals and plants. This first of its kind GIS Map Service enables agency users to integrate MTNHP Element Occurrence (EO) data with internal MDT information in ArcGIS on the users' desktop.

Some of the key features are:

- It is a secure login/password based service housed on the Montana Natural Resource Information System server.
- The service is available 24 hours per day, 7 days per week.
- The map service directly accesses the most current MTNHP element occurrence database, enabling users to view and analyze the most up-to-date information available as vector features with their ArcGIS work session.
- The client GIS application can not edit the data in the map service itself, thus protecting the integrity and reliability of the source data.

Information Services

We remain very busy adding to our databases and filling data requests. **To date this year, MTNHP staff have created over 10,000 new element occurrences** and updated or revised more than 6,400 element occurrences. They have also reviewed more than 28,000 point observation records (POD) and over 4,000 POD records for accuracy.

Since March 1, 2007, we have conducted nearly 900 species of concern reviews for projects and planning requests, or an average of 4.5 per business day.